REMARKS

This amendment is in response to the outstanding final Official Action mailed January 6, 2004, the shortened statutory period for response having expired April 6, 2004. In this regard, Applicants submit herewith a three-month extension petition to reset the deadline for responding to the Official Action to and including July 6, 2004. In addition, Applicants submit herewith a Notice of Appeal from the final rejection. In view of the above amendments and below remarks, reconsideration of the Examiner's rejection is respectfully requested.

As a preliminary matter, the undersigned wishes to thank Examiner Christina Ildebrando for the courtesies extended by her during the interview conducted via telephone on May 28, 2004. During that interview pending claims 39-63 were discussed in connection with the anticipation rejection based on *Yamada et al.* (JP 7-144128). The undersigned articulated Applicants' position that the pending claims do distinguish over the art in that they require that the oxidation catalyst be "enclosed within" a first porous structure, and that this is a structural limitation not disclosed in *Yamada et al.*, one necessary to the claimed invention to achieve the desired results. Following our discussion, Examiner Ildebrando requested that we submit our position in writing for further consideration.

The present application includes claims 39-102, of which claims 39 and 78 are the sole independent claims, and claims 78-102 have been added by this amendment. Claims 39-63 were elected, with traverse, over claims 64-77 by an Amendment in Response to Restriction Requirement submitted on April 16, 2002. Accordingly, claims 64-77 have been canceled.

Claims 39-63 stand rejected pursuant to 35 U.S.C. § 102(b) as unpatentable over *Yamada et al.* While the Examiner has cited to Japanese Patent No. 7-144128, Applicants have instead referred to what Applicants believe to be the corresponding U.S. patent relating to *Yamada et al.*, namely,

U.S. Patent No. 5,744,103. Applicants also referred to this reference during the interview with Examiner Ildebrando.

The Examiner states that *Yamada et al.* discloses an adsorbent composition for exhaust gas cleaning comprising a zeolite having pores of a larger diameter and a zeolite having pores of a smaller diameter which are physically mixed or laminated adjacently. "The reference teaches a mixture of 8 membered ring crystalline structures such as CHA having a pore diameter of 0.3-0.5 nm, 10 membered ring crystalline structures such as MFI, MEL, and FER having a pore diameter of 0.4-0.6, and 12 membered ring crystalline structure such as FAU and BEA having pore diameter of 0.6-0.75 nm ([0015]-[0017] and Table 1)." With respect to catalysts, the Patent Office states that "the composition is impregnated with catalytic metals such as Pt and Rh ([0056])." The Patent Office refers specifically to the example wherein a hydrogen-form (acidic) MFI-FAU composite is prepared which is impregnated with Pt and Rh, the composite being loaded onto a honeycomb support.

The Examiner states that with respect to the language of the claims, the 8 and 10 membered ring crystalline structure would meet the first porous structure and the 12 membered ring crystalline structure would meet the second porous structure, and that the impregnation of the adsorbent component with platinum and rhodium would meet the oxidation and reduction catalyst elements of the claims.

Finally, the Examiner disregards the intended use recitations in these claims, stating that they must result in a structural difference in order to patentably distinguish over the art, citing *In re Casey*, 370 U.S.P.Q. 235, and *In re Otto*, 312 U.S.P.Q. 458. This was reiterated in the interview with Examiner Ildebrando, who explained that missing from the claims at issue was some structural element that would distinguish over the prior art.

Applicants have provided certain amendments to further clarify the nature of the invention including revision of independent claim 39, and the addition of claims 78-102. Claims 78-102 are substantially identical to claims 39-63 (prior to amendment) with the exception of clarifying language added to independent claim 78.

During the interview, Applicants noted that independent claim 39 recites that the oxidation catalyst is "enclosed within" the first porous structure, and that this is a structural limitation that distinguishes the invention from what is disclosed in *Yamada et al.* The Examiner has apparently disagreed. Applicants have now amended independent claim 39 to clarify this aspect of the invention by incorporating the second porous structure of claim 40, and including the language "said second porous structure being substantially free of said oxidation catalyst." Newly added claim 78 recites "a first porous structure having an outer layer" and "said oxidation catalyst enclosed within said first porous structure and substantially excluded from said outer layer thereof . . . ."

To understand how these features distinguish over the prior art and render the subject matter patentable one must understand the object of the present invention, which is to facilitate reactions which more effectively and simultaneously eliminate nitrogen oxides and hydrocarbons from engine exhaust. Referring specifically to page 35 of the present application, four competing reactions are noted, designated D, E, F and C. The goal of the invention is to facilitate reaction C, which eliminates both nitrous oxides and hydrocarbons. To eliminate NO, however, it must be converted to NO_2 via reaction D.

The challenge addressed by Applicants, however, is, that when an oxidation catalyst is combined with hydrocarbons, NO, NO_2 and oxygen, the preferred reactions are not favored. Instead, what occurs is (1) the oxidation of hydrocarbons in accordance with reaction E, which limits the availability of

oxygen and effects the desired conversion of NO to NO_2; and (2) the very undesirable reaction F, whereby N_2O is produced.

To solve this problem, Applicants "enclosed" the oxidation catalyst within a porous structure including pores sized to sterically prevent the reducing agent, namely hydrocarbons of a particular size, from contacting the oxidation catalyst. NO, however, is able to enter the porous structure, and, therefore, the primary reaction that occurs is the desired conversion of NO to NO_2 via reaction D. In one embodiment of this invention, a second porous structure is also provided, in which the desired final conversion takes place. The second porous structure has pores larger in size than those of the first porous structure so that the reducing agents are able to contact the reducing agent disposed therein. Thus, conversion of NO to NO_2, and the subsequent conversion of NO_2 and hydrocarbons to N_2, CO_2 and water is favored. Accordingly, it can be readily seen why it is critical that the oxidation catalyst be enclosed within the first porous structure and that the second porous structure be substantially free of the oxidation catalyst.

With respect to claim 39, Applicants have clarified the placement of the oxidation catalyst by reciting the second porous structure, and that the second porous structure is substantially free of the oxidation catalyst. With respect to newly added claim 78, recited is an outer layer of the first porous structure, and that the oxidation catalyst is excluded from that outer layer. In both cases, the structure provides for selective oxidation within the pores of the first porous structure, and not outside of the pores, where unwanted oxidation would occur.

For illustrative purposes, Applicants direct the Examiner's attention to Figure 1 of the pending application. Depicted is a porous material 1 including a first porous structure 2,2' and a second porous structure 5,5'. The first

porous structure is adapted to prevent the reducing agent or hydrocarbon HC from contacting oxidation catalyst OX (represented by 4,4'), while the conversion of NO to O_2 takes place (represented by 3). The oxidation catalyst is excluded from outer layer 8 of the first porous structures (this is also referred to on page 21 of the specification). Disposed within the second porous structure 5,5' is a reducing agent RED. NO_2 produced by the conversion of NO to NO_2 reacts with HC to produce N_2, CO_2 and water (represented by 6). This simplistic diagram illustrates the structural limitations of the claims wherein the oxidation catalyst is enclosed within the first porous structure, the oxidation catalyst is excluded from an outer layer of the first porous structure, and the second porous structure is substantially free of the oxidation catalyst.

In contrast, *Yamada et al.* does not teach the structure recited by the claims because it is not directed to achieving the same result. Indeed, the structure taught in *Yamada et al.* could not possibly achieve those results. Again, the Examiner points to the example wherein an "MFI-FAU composite is prepared which is impregnated with Pt and Rh. The composite is loaded on a honeycomb support." The example to which the Examiner is referring appears to correspond to that found at Col.7, line 59 to Col.8, line 41 of the '103 patent. The "eighth aspect" disclosed by *Yamada et al.* includes an MFI-FAU type structure, the "ninth aspect" combining that structure with a catalytic metal. However, the catalytic metal is not "enclosed within" the MFI type structure, instead being applied to both the MFI and FAU type structures. At this point in the reference, there is no detail with respect to how the catalyst is applied, however, *Yamada et al.* states "the decomposition of the hydrocarbon occurs also within the pores of the adsorbent component although the conventional decomposition of the hydrocarbon with zeolite mainly occurs at a surface of the zeolite particle. In the cleaning catalyst according to the

present invention, it is preferable that the catalytic metal decomposes not only the hydrocarbon but also NO_x contained in the exhaust gas." Thus, in contrast to the presently claimed invention, the oxidation catalyst is free to react with the reducing agent.

This is further supported by detailed examples provided in the *Yamada et al.* reference starting at column 14, line 7. For example, an MFI:FAU mixture disclosed in example 8 was used in examples 11-13 in connection with a catalytic metal. In example 11, the MFI:FAU mixture was wash-coated on a honeycomb support, followed by impregnation with a palladium nitrate solution. In example 12, the mixture was again wash-coated on a honeycomb support, after which a cerium oxide powder carrying Pd was wash coated on the support to produce a laminate type structure. Finally, in example 13, the MFI:FAU mixture and a Pd carrying oxide powder were mixed, the resultant mixture then being wash-coated on a honeycomb support.

Each of these examples is distinguishable from the present invention for the same reason — the Pd catalyst is indiscriminately applied to both the smaller and larger pore structures. Accordingly, the undesired reactions discussed previously wherein hydrocarbons react with available O_2 (reaction E), and N_2O is produced (reaction F), freely occur. *Yamada et al.* teaches no separation of the oxidation catalyst capable of converting NO to NO_2 from the reducing agent. This is completely contrary to the object of the present invention, and the invention as claimed.

Accordingly, Applicants submit that the claims, and particularly independent claim 39, are patentable over *Yamada et al.*, at the least, because the oxidation catalyst is enclosed within the first porous structure, while the second porous structure is substantially free of the oxidation catalyst. With respect to newly added independent claim 78, this claim is also distinguishable in that the oxidation catalyst is enclosed

within the first porous structure, and more particularly that the oxidation catalyst is excluded from an outer layer of the first porous structure.

In considering Applicants' within response, Applicants designate the rejected dependent claims as being allowable by virtue of their ultimate dependency upon submittedly allowable independent claims. Although Applicants have not separately argued the patentability of each of the dependent claims, Applicants' failure to do so is not to be taken as an admission that the features of the dependent claims are not themselves separably patentable over the prior art cited by the Examiner.

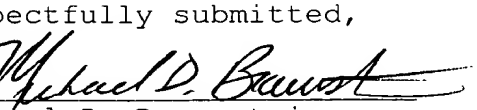
In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

If, however, for any reason, the Examiner does not believe that such action can be taken at this time, it is respectfully requested that she telephone Applicants' attorney at (908) 654-5000 in order to overcome any additional objections which she might have.

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

Dated: July 6, 2004

Respectfully submitted,

By 

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